

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI

**DIPLOMA PROGRAMME IN ELECTRONICS & TELE-COMMUNICATION
ENGINEERING**

Semester – V

COURSE OF STUDY AND SCHEME OF EXAMINATION

S. No	Board of Study	Course Code	Course	Periods/Week (In Hours)			Scheme of Examination						Credit L+(T+P)/2
				L	T	P	Theory			Practical		Total Marks	
							ESE	CT	TA	ESE	TA		
1.	Electronics & Telecomm Engg..	228511 (28)	Instrumentation & Process Control	4	1	-	100	20	20	-	-	140	5
2.	Electronics & Telecomm Engg..	228512 (28)	Antenna & Microwave Communication	3	1	-	100	20	20	-	-	140	4
3.	Electronics & Telecomm Engg..	228513 (28)	Audio Engineering & Acoustics	3	1	-	100	20	20	-	-	140	4
4.	Electronics & Telecomm Engg..	228514 (28)	Microprocessor & Application	4	1	-	100	20	20	-	-	140	5
5	Electronics & Telecomm Engg..	228515 (28)	Electronic system design	3	1	-	100	20	20	-	-	140	4
6.	Electronics & Telecomm Engg..	228521 (28)	Instrumentation & Process Control Lab	-	-	3	-	-	-	30	10	40	2
7.	Electronics & Telecomm Engg..	228522 (28)	Antenna & Microwave Communication Lab	-	-	2	-	-	-	30	10	40	1
8.	Electronics & Telecomm Engg..	228523 (28)	Audio Engineering & Acoustics Lab.	-	-	2	-	-	-	30	10	40	1
9.	Electronics & Telecomm Engg..	228524 (28)	Microprocessor & Application Lab	-	-	3	-	-	-	30	10	40	2
10	Electronics & Telecomm Engg..	228525 (28)	Computer Aided Design & Drafting Lab.	-	-	3	-	-	-	30	10	40	2
11	Electronics & Telecomm Engg..	228526 (28)	Industrial Training*	-	-	1	-	-	-	80	20	100	1
TOTAL				17	5	14	500	100	100	230	70	1000	31

L : Lecture hours : T : Tutorial hours, P : Practical hours ESE – End of Semester Exam.;

CT – Class Test; TA- Teacher's Assessment ;

***Industrial Training** : One month training will be organized after 4th semester examination and it's evaluation will be done in 5th semester.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL
UNIVERSITY, BHILAI**

- A) **SEMESTER** : **V**
 B) **SUBJECT TITLE** : **INSTRUMENTATION & PROCESS CONTROL**
 C) **CODE** : 228511 (28)
 D) **BRANCH/DISCIPLINE** : **Electronics & Tele-communication**
 E) **RATIONALE** : It is difficult to name any branch of science and engineering where instrumentation and control is not at work recovering the vital information on which much of our engineering progress depends.

The field of instrumentation may be divided in to two main segments. One relates to measurement and other relates to control. The integration of these two areas is attempted through strong emphasis on their interrelationship and elaboration of their respective merits. This course of instrumentation and process control develops an understanding of transducers, signal conditioner, control system, display devices and programmable logic controllers.

F) TEACHING AND EXAMINATION SCHEME:

Course Code	Periods/Week (In Hours) (Teaching Scheme)			Scheme of Examination						Credit L+(T+P)/2
	L	T	P	Theory			Practical		Total Marks	
				ESE	CT	TA	ESE	TA		
228511 (28)	4	1	-	100	20	20	-	-	140	5
228521 (28)	-	-	3	-	-	-	30	10	40	2

L : Lecture hours : T : Tutorial hours, P : Practical hours
 ESE – End of Semester Exam.; CT – Class Test; TA- Teacher’s Assessment

G) DISTRIBUTION OF MARKS AND HOURS:

Sl. No.	Chapter No.	Chapter Name	Hours	Marks
1	1	Introduction to instrumentation & process control	10	15
2	2	Transducers	20	25
3	3	Control system	25	30
4	4	Programmable Logic Controllers (PLC)	25	30
		Total	80	100

H) DETAILED COURSE CONTENTS:

Chapter – 1 : Introduction to instrumentation & process control

- Need of instrumentation & control.
- Block diagram of a general instrumentation system and their broad functions
- Block diagram of instrumentation system for measurement of various non-electrical parameters.

Chapter – 2 : Transducers

- Classification of transducers
- Types of errors in transducers
- Application of transducers for the measurement of Length, Thickness, Displacement, Velocity, Force, Weight, Torque, Pressure, Level, Temperature, Strain, P.H. measurement, Speed etc.
- Selection of transducer for specific application.

Chapter – 3 : Control system

- Role of control system in instrumentation
- Open and close loop control system
- Different types of control system such as ON-OFF, Step, Continuous, PID control etc.
- Servomechanism and regulators with suitable examples
- Control components
- Construction. Working principle, merits and demerits and applications of following control components
 - AC, DC servo motor
 - Synchros
 - AC, DC tacho generators
 - Stepper motor
 - Solenoid valve, motorized valve, servo valve
 - Control transformer
 - Servo voltage stabiliser

Chapter – 4 : Programmable Logic Controllers (PLC)

- Electrical control system: control sequence, connections for controlling sequences
- Introduction to PLCs: need of PLC, function of PLC, advantages of PLC compared to Hard-Wired connections, components of PLC
- Programmable controllers: types of PLC, specification of a PLC, block diagram.
- PLC programming: programming device, PLC programming methodologies, ladder diagram, features of different PLC programming
- Ladder diagram: types of ladder diagram, symbols, frame work of a ladder diagram, drw equivalent wiring diagram for a ladder diagram (simple circuit)
- Programming the PLC: I/O numbering system, properties of ladder logic programmers, simple ladder logic diagram,
- Boolean logic programming: various Boolean function set and mnemonics, features of Boolean logic programming,
- Function block: features of function block programming, significance of function block, function chart programming
- PLC configuration: open-loop and closed loop control circuit, PLC counter, timer, communication between PLC-PLC and PLC counter

I) SUGGESTED INSTRUCTIONAL STRATEGIES:

- Lecture session with question and answer
- Use of audio visual aids
- Assignment on various topics
- Moreover, when teaching this course, more troubleshooting exercises have to given in laboratory.

J) SUGGESTED LEARNING RESOURCES.

(a) Reference Books :

Sl. No.	Title	Author, Publisher, Edition & Year
1	Instrumentation for Engineering Measurements	Cerni & Foster; Tata McGraw Hill, New Delhi 5 th ,1986
2	Electronic Instrumentation & Measurement Techniques	Cooper; Prentice Hall, New Delhi 8 th , 2000
3	Instrumentation for Engineering Measurements	Dally, J.W. & Others; John Wiley & Sons, New York 1 st ,1984
4	Introduction to Instrumentation and Control	Ghosh, A.K.; PHI, New Delhi 1992
5	Process Control Instrumentation Technology	Johnson, McGraw Hill, New York 1992
6	Instrumentation, Measurement & Feedback	Jones; McGraw Hill, New York 1 st ,1994
7	Electronic Instrumentation	Kalsi, J.S.; Tata McGraw-Hill, New Delhi 1995
8	Handbook of Bio-Medical Instrumentation	Khandpur; Tata McGraw-Hill, New Delhi 2001
9	Electronic Instrumentation	Malvino; Tata McGraw Hill, New Delhi 2 nd ,1987
10	Instrumentation Devices and Systems	Rangan, C.S., et al; Tata McGraw Hill, New Delhi 1990
11	Electronic Measurements & Instrumentation	Rao & Sutrave; Nirali Prakashan, Pune 2 nd ,1988
12	A course in Electrical & Electronic Measurements & Instruments	Sawhney; Dhanpat Rai & Sons, New Delhi 11 th ,2000
13	Industrial Instrumentation and Control	Singh, S.K.; Tata McGraw Hill, New York 1991

(b) Others:

- Lab Manuals.

LIST OF PRACTICALS / TUTORIALS:

- a) Displacement measurement using LVDT
- b) Weight measurement using strain gauge bridge
- c) Speed measurement of motor using magnetic proximity switch
- d) Speed measurement of motor using photo electric pickup
- e) Temperature measurement using thermocouple
- f) Temperature measurement using resistance temperature detector
- g) Temperature measurement using thermistor
- h) Performance of piezo electric transducers
- i) Displacement measurement with help of light dependent resistor
- j) Displacement measurement using inductive pick up transducer
- k) Pressure measurement using load cell
- l) Liquid level measurement using capacitive type transducer
- m) Proportionate mode of control
- n) Proportionate + integral type control
- o) Proportionate + integral + derivative control
- p) Performance of data acquisition system

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL
UNIVERSITY, BHILAI**

- A) **SEMESTER** : **V**
 B) **SUBJECT TITLE** : **ANTENNA & MICROWAVE
COMMUNICATION**
 C) **CODE** : 228512 (28)
 D) **BRANCH/DISCIPLINE** : **Electronics & Tele-communication**
 E) **RATIONALE** : The course aim is to provide up to date knowledge and skill in microwave communication since it is prominent medium of communication at higher frequencies. The course covers wave propagation techniques, antennas and microwave devices and sources. The emphasis has been given on operation and control of above devices. So that the student may acquire the skill to operate and control the microwave setups. The basic concept of transmission lines has also been highlighted.

F) TEACHING AND EXMINATION SCHEME:

Course Code	Periods/Week (In Hours) (Teaching Scheme)			Scheme of Examination						Credit L+(T+P)/2
	L	T	P	Theory			Practical		Total Marks	
				ESE	CT	TA	ESE	TA		
228512 (28)	3	1	-	100	20	20	-	-	140	4
228522 (28)	-	-	2	-	-	-	30	10	40	1

L: Lecture hours; T: Tutorial hours, P: Practical hours
 ESE – End of Semester Exam; CT – Class Test; TA- Teacher’s Assessment

G) DISTRIBUTION OF MARKS AND HOURS:

Sl. No.	Chapter No.	Chapter Name	Hours	Marks
1	1	Wave propagation	12	25
2	2	Microwave devices and components	18	30
3	3	Microwave Measurement	10	20
4	4	Transmission Line & their characteristics	8	10
5	5	Antenna fundamental and their characteristics	16	15
		Total	64	100

H) DETAILED COURSE CONTENTS:

Chapter – 1 : Wave propagation

- Ground wave surface wave.
- Space- wave ionosphere, reflection in ionosphere.
- Skip distance and multihop transmission. Optimum frequency.
- Guided waves and wave-guides, concept, mode theory & its excitation, wave-guide components.

Chapter – 2 : Microwave devices and components

- Limitations of transistors at Microwave frequencies, Microwave transistors. Parametric amplifier, Tunnel diode Gunn effect Gunn diode oscillators avalanche effect IMPATT & TRAPATT PIN diode and their applications Stimulated emission of devices such MASERS & LASERS, T-junction magic Tee, Attenuators, Direction-couplers bends, Isolators & circulators.
- Generation of microwaves by tubes, limitation of conventional tubes, velocity modulation klystron amplifier, reflex klystron, magnetron, traveling wave tube (TWT), backward wave oscillator (BWO), their specification (e.g. power output, frequency etc.) uses and limitations. Power supply and their specifications.

Chapter – 3 : Microwave Measurement

- VSWR measurement, microwave power measurement, frequency measurement, measurement of attenuation.

Chapter – 4 : Transmission Line & their characteristics

- Propagation constants, Attenuations constant, characteristic impedance concept of incident and reflected wave. Standing wave and VSWR. Short circuit and open circuit line. Half wave quarter wave, eight wave line and their uses. Co-axial cable and their construction. Calculation of characteristic impedance of co-axial cable.

Chapter – 5 : Antenna fundamental and their characteristics

- Characteristic of various antennas and their specifications, behaviour and uses at different frequencies.
- Functions of an antenna.
- Need of an antenna and design of the antenna for specific use.
- Radiation, Radiated field strength at a point, Radiation pattern, Elementary antenna, dipole antenna. Half wave antenna, directive resistance effective length of antenna, Beam width and Bandwidth of antenna. Distribution of voltage and current for half wave dipole. Antenna arrays, Broadside and end fire array orientation and polarization of antenna.
- Type of antenna, their uses. Broadcast, long wave, medium wave & short wave loop and helical antenna, Horn, Yagiuda, Folded dipole and Rhombic Antenna. Parabola reflector antenna and log periodic antenna.

I) SUGGESTED INSTRUCTIONAL STRATEGIES:

- Lecture session with question and answer
- Use of audio visual aids
- Assignment on various topics

- Moreover, when teaching this course, more troubleshooting exercises have to given in laboratory.

J) SUGGESTED LEARNING RESOURCES.

(c) Reference Books :

Sl. No.	Title	Author, Publisher, Edition & Year
1	Microwave Principle	Herbert J. Reich, C.B.S. Delhi
2	Antennas	John D.K. Kraw, T.M.H. Delhi
3	Electromagnetic theory, Components & Devices	Seeger J.A.
4	Electromagnetic theory	Franklin D.R.
5	Electromagnetic waves & Radiating System Ed2	Jordan BC & Balman K.G.
6	Theory & Electromagnetic waves - A coordinate free approach	Chan H.C.
7	Microwave devices & circuits Ed. 2	LIAO S.Y.
8	Electromagnetic wave theory	WALT J.R.
9	Microwaves	Gupta K.C.
10	Elements of Microwave Engg.	Chatterjee R.

(d) Others:

- VCDs.
- Learning Packages.
- Lab Manuals.
- Charts.

Subject: Antenna & Microwave Communication Lab

Practical Code : 228522 (28)

Hours: 32

LIST OF PRACTICALS / TUTORIALS:

1. Performance of Gunn Diode & Gunn Oscillator.
2. Performance of Klystron & Reflex klystron tubes.
3. Study of Magnetron.
4. Study of Isolators, directional couplers (cross directional & multihole) slotted line & block diagram of basic microwave bench.
5. Performance of VSWR meter.
6. Measurement of frequency of microwave.
7. Measurement of guide wavelength.
8. Measurement of Standing wave ration (VSWR).
9. Measurement of reflection coefficient.
10. Measurement of cutoff wavelength (TE₁₀ mode) Using $C=2/(m/a) + (n/b)=2a$.
11. Study of E-plane, H-plane and Magic Tee's.
12. Performance of pin diode and pin modulator.
13. Measurement of guided power.
14. Measurement of attenuation in dB for a given component.
15. Study of wave-guide Horn-Antenna.
16. Measurement of load impedance.
17. Measurement of characteristics of klystron tube & Gunn Oscillator.
18. Measurement of radiation 7 diffraction through Horn - antenna's.
19. Assembling the microwave bench.
20. Study of UHF & VHF Transmitters.
21. Study of radiation pattern for different antennas.
22. Measurement of characteristic for different antennas.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL
UNIVERSITY, BHILAI**

- A) **SEMESTER** : **V**
 B) **SUBJECT TITLE** : **AUDIO ENGINEERING & ACOUSTICS**
 C) **CODE** : **228513 (28)**
 D) **BRANCH/DISCIPLINE** : **Electronics & Tele-communication**
 E) **RATIONALE** : The aim of the subject Audio techniques is to make students familiar with sources of sound generation, characteristics of sound waves and incorporation of these character, with recording and reproduction techniques along with the sound amplification, audio processing techniques etc. Transmission/reception techniques, equipment and their uses at transmitting/receiving end. The course deals with operation, testing, alignment, troubleshooting and maintenance of equipment used at transmitter and receiving station. The course also covers basic transmission techniques and their generation and detection circuits.

The course has been designed to meet the employment need of All India Radio stations and various transmitting centers, Audio recoding stations, for the level of test/ services engineer, supervisor, maintenance technician. It also promote the self employment in repair & maintenance of radio receivers and associated circuits.

F) TEACHING AND EXMINATION SCHEME:

Course Code	Periods/Week (In Hours) (Teaching Scheme)			Scheme of Examination						Credit L+(T+P)/2
	L	T	P	Theory			Practical		Total Marks	
				ESE	CT	TA	ESE	TA		
228513 (28)	3	1	-	100	20	20	-	-	140	4
228523 (28)	-	-	2	-	-	-	30	10	40	1

L : Lecture hours : T : Tutorial hours, P : Practical hours

ESE – End of Semester Exam.; CT – Class Test; TA- Teacher’s Assessment

G) DISTRIBUTION OF MARKS AND HOURS:

Sl. No.	Chapter No.	Chapter Name	Hours	Marks
1	1	Characteristics of sound	10	15
2	2	Sound transducers	20	30
3	3	Sound transmission	20	30
4	4	Acoustics	14	25
Total			64	100

H) DETAILED COURSE CONTENTS:

Chapter – 1 : Sound transducers

- **Microphone:** Introductions to microphones, construction, function and uses of various microphones; Carbon, Condenser, Crystal, Dynamic
- **Loudspeakers**
 - Introduction to loudspeakers
 - Construction, functioning and uses of various loudspeakers
 - Permanent magnet moving coil
 - Baffles
 - Horns and woofers
 - Tweeters and woofers
 - Co-axial speakers
 - Loudspeaker enclosure speakers.

Chapter – 2 : Sound Recorders

- Introduction to sound recording.
- Types of sound recording
- Film reel
- Tab
- Cassettes Player
- Compact disc Player (CD/DVD)
- Construction of sound recorders
- Operation of sound recorders and its uses.
- Connecting techniques of loudspeaker with diverse power requirements

Chapter – 3 : Sound transmission

- Bass and treble control equalizer.
- Hi-Fi system
- Stereo system
- Planning and installation of sound system for an auditorium for open air and indoor.
- Requirements of conference rooms.
- PA system and its installation
 - Block diagram
 - Choice of system for various applications
 - Distribution arrangements.

Chapter – 4 : Acoustics

- Characteristics of sound : Sound syllable, Loudness/Intensity, Harmonics/string/pitch tones, TOH/TOD/Dynamic range, Sound level/phon/sones, Sound distortion
- Reverberation/Echo/Doppler effect/Resonance
- Reverberation/Reverberation time its significances
 - Materials for acoustical treatment
 - Acoustical properties of materials
 - Acoustical conditions for open air closed hall/auditoriums
- Sound processing
 - Pre emphasis/post emphasis
 - Equalization/Fedger/Echo/Reverberation

- Enter channel noise
- Noise Reduction/noise limiting
- Sound compression
- Recording techniques
 - Tape recording
 - Mono/Stereo Multi channel recording
 - Analog/Digital conversion
 - Recording Formats (MPEG)
- Sparkers & Enclosures
 - Baffle
 - Types of Baffle
 - Laybrinthe/Bass refer/Phone cune woofer/sub woofer

I) SUGGESTED INSTRUCTIONAL STRATEGIES:

- Lecture session with question and answer
- Use of audio visual aids
- Assignment on various topics
- Moreover, when teaching this course, more troubleshooting exercises have to given in laboratory.

J) SUGGESTED LEARNING RESOURCES.

(e) Reference Books:

Sl. No.	Title	Author, Publisher, Edition & Year
1	Audio Hand book	Numes Butter worth
2	Audio - Video Hand book	Numes Butter worth
3	Video Cassette Recorders	K.D. Desai, Jeevan Deep Prakashan, Mumbai, 2 nd , 1988
4	Audio Video Systems	Ajay Sharma, Dhanpat rai & sons
5	Audio & Video Systems	R.G.Gupta, TMH

(f) Others:

- VCDs.
- Learning Packages.
- Lab Manuals.
- Charts.

Subject: Audio Engineering & Acoustics Lab.

Practical Code : 228523 (28)

Hours: 32

LIST OF PRACTICALS / TUTORIALS:

1. Study of different type of a microphone their sensitivity & directivity.
2. Study various types of loudspeaker & their characteristic & application.
3. Study of pre - amplifier and its controls
4. Study of sound mixer
5. Study of stereo system & controls
6. Study of Hi-Fi system frequency response
7. Study of record players, changers and their operation
8. Study common faults in record player and their rectification
9. Study of feel to reel recorder and cassette recorder and identification of mechanical and electrical parts.
10. Trouble shooting tape recorders and cassette recorders.
11. Study of complete circuit drawing of PA system & tape recorders.
12. Study of CD player
13. Familiarization with studio acoustic.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL
UNIVERSITY, BHILAI**

- A) **SEMESTER** : V
 B) **SUBJECT TITLE** : **MICROPROCESSOR & APPLICATIONS**
 C) **CODE** : **228514 (28)**
 D) **BRANCH/DISCIPLINE** : **Electronics & Tele-communication**
 E) **RATIONALE** : This course is intended to help the students to understand principle of working of microprocessor & their applications including programming, interfacing and various peripherals used. Students can use the knowledge and skills gained to apply them in new related situations.

F) TEACHING AND EXMINATION SCHEME:

Course Code	Periods/Week (In Hours) (Teaching Scheme)			Scheme of Examination						Credit L+(T+P)/2
	L	T	P	Theory			Practical		Total Marks	
				ESE	CT	TA	ESE	TA		
228514 (28)	4	1	-	100	20	20	-	-	140	5
228524 (28)	-	-	3	-	-	-	30	10	40	2

L : Lecture hours : T : Tutorial hours, P : Practical hours
 ESE – End of Semester Exam.; CT – Class Test; TA- Teacher’s Assessment

G) DISTRIBUTION OF MARKS AND HOURS:

Sl. No.	Chapter No.	Chapter Name	Hours	Marks
1	1	Introduction to microprocessor	08	10
2	2	Microprocessor 8085	14	15
3	3	Instruction set & programming of 8085	20	25
4	4	Stack, sub routine & interrupts	10	15
5	5	Interfacing peripherals	20	25
6	6	Microprocessor based systems	08	10
		Total	80	100

H) DETAILED COURSE CONTENTS:

Chapter – 1 : Introductions To Microprocessor

- Hardware Concepts: Block diagram of Microprocessor System, Input, Output devices, Memory; Mapping techniques.
- Software Concepts: Data, Instruction, Program Concepts, Assemblers, Interpreter, and Compilers.

Chapter – 2 : Microprocessor – 8085

- Architecture of 8085: Address Bus, data bus, control bus, ALU, Registers, control logic, etc.
- Operation: Microprocessor initiated, internal data, Memory read/write, I/O Read/Write.
- Timing Cycle: T-States, Machine Cycle: - Read cycle, Write cycle.

Chapter – 3 : Instruction Set & Programming of 8085 Microprocessor

- Instruction Set: Data transfer instruction; Arithmetic & logic operation instruction; Branching & Looping operation instruction; Additional data transfer & 16 bit arithmetic instruction
- Programming: Writing assembly language programs & debugging; Counters & time delays programs; Code conversion, BCD arithmetic & 16 bit data operation programs.

Chapter – 4 : Stack, Subroutines & Interrupts.

- Stack & Subroutines: Concept of stack & Subroutines, Call & return instructions, Assembly language programs
- Interrupts: Types of interrupts - Hardware & software interrupts; Maskable & Non Maskable Interrupts, Vectored & Non Vectored interrupts, polling.

Chapter – 5 : Interfacing Peripherals

- Parallel I/O & Interfacing Applications: I/O interfacing: - Parallel I/O, I/O instructions; Memory Mapping, Memory mapped I/O
- Programmable Peripheral Interface chip 8255 and 8253 – Functional block diagram; Internal block diagram and functions in details.
- Functions of: DMA controller chip 8279 and 8251

Chapter – 6 : Microprocessor Based System

- 7 segment LED interfacing
- Microprocessor Based Stepper Motor Control
- Temperature Controllers
- Traffic light Controller

I) SUGGESTED INSTRUCTIONAL STRATEGIES:

- Lecture session with question and answer. Use of microprocessor based interfacing kits. Moreover when teaching this course, drill and practice on programming exercises have to given as classroom and home assignment.

J) SUGGESTED LEARNING RESOURCES

(g) Reference Books :

Sl. No.	Title	Author, Publisher, Edition & Year
1	Microprocessor Architecture	Gaonkar,Ramesh S., Willey Eastern

	Programming & Application.	Publication, 1 st , 1989.
2	Introduction To Microprocessor	Mathur, Aditya P., Tata-Mc Graw Hills Pub. , 1 st , 1990
3	Introduction to Microprocessor: Software, Hardware Programming	Laventhall, Lance A. Prentice-Hall Pub. 1 st , 1988
4	Microprocessor and Digital Systems	Douglus V. Hall, Mc. Graw Hill Pub
5	Microprocessors & Interfacing	Dougus V. Hall Mc. Graw Hill Pub, 1 st , 1984
6	Microprocessors & Fundamentals	B. Ram, Dhanpat Rai & Sons Pub
7	Introduction to Microprocessor	Vibhuti
8	Microprocessor & Microcontroller	B. Ram.

(h) Others:

- VCDs.
- Learning Packages.
- Lab Manuals.
- Charts.

Subject: Microprocessor & Application Lab

Practical Code : 228524 (28)

Hours: 48

LIST OF PRACTICALS / TUTORIALS:

1. Study of architecture of microprocessor 8085
2. Assembly Language Programming
3. Addition of two 8-bit numbers
4. Addition of two 16- bit nos.
5. Subtraction of two 8- bit nos.
6. Subtraction of two 16 – bit nos.
7. Multiplication of two 8- bit nos. using repeated Addition.
8. Division of two 8- bit nos.
9. Find 1's & 2's complement of a 8 – bit & a 16 –bit number
10. Find Larger No. of two 8 bit Numbers
11. Find largest smallest No. from an array
12. Transfer Block of data bytes from one memory location to another in same order & in reverse order.
13. Arrange data bytes in ascending / descending order.
14. Find the sum of positive nos. from an array & store the result at some memory location (Ignore negative nos.)
15. Inter facing of IC 8255.

16. Inter facing of IC 8155.
17. Inter facing of IC 8279.
18. Inter facing of IC 8257.
19. Microprocessor based stepper Motor control.
20. Microprocessor based Temperature control.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL
UNIVERSITY, BHILAI**

- A) **SEMESTER** : **V**
 B) **SUBJECT TITLE** : **ELECTRONIC SYSTEM DESIGN**
 C) **CODE** : **228515 (28)**
 D) **BRANCH/DISCIPLINE** : **Electronics & Tele-communication**
 E) **RATIONALE** : This course is intended to help the students to appreciate the design aspects of various basic electronic circuits & their applications in various other complex circuits. It also covers the latest development in the different electronics system. Students also use the knowledge and skills gained to apply them in new related situations.

F) TEACHING AND EXAMINATION SCHEME:

Course Code	Periods/Week (In Hours) (Teaching Scheme)			Scheme of Examination						Credit L+(T+P)/2
	L	T	P	Theory			Practical		Total Marks	
				ESE	CT	TA	ESE	TA		
228515 (28)	3	1	-	100	20	20	-	-	140	4

L : Lecture hours : T : Tutorial hours, P : Practical hours

ESE – End of Semester Exam.; CT – Class Test; TA- Teacher’s Assessment

G) DISTRIBUTION OF MARKS AND HOURS:

Sl. No.	Chapter No.	Chapter Name	Hours	Marks
1	1	Power supply system	15	25
2	2	Constant current sources	12	25
3	3	Small signal amplifiers	12	15
4	4	Sinusoidal oscillators	15	25
5	5	Introduction of CNT	10	10
		Total	64	100

H) DETAILED COURSE CONTENTS:

Chapter – 1: Power Supply System

- Unregulated dc power supply system with rectifiers and filters
- Design of emitter follower regulators
- Series regulators

- Overload protection circuits for regulators
- Design of SMPS : stepup and step down

Chapter – 2: Constant Current Sources

- Design of function generators
- Design of tuned amplifiers
- Design of Butterworth filter, Chebyshev filter upto 4th order.

Chapter –3: Small Signal Amplifiers

- Emitter follower
- Darlington pair amplifier with and without bootstrapping
- Two stage direct couple amplifier
- Design of class A , class AB, audio power amplifier with drivers.

Chapter – 4 : Design of sinusoidal oscillators

- Opamps based wein bridge and phase shift ascillator with AGC circiuts.
- Transistor based Hartely, colpitts and crystal oscillator
- Evaluation of figure of merit for all above oscillator circuits.

Chapter – 5 : Introduction of CNT (Carbon Nano Tubes)

- Doide, Transistors, Insulators, Conductors
- Nano tube based IC's.

I) SUGGESTED INSTRUCTIONAL STRATEGIES:

- Lecture sessions
- Use of audio visual cassettes
- Assignments on various topics

J) SUGGESTED LEARNING RESOURCES.

(i) Reference Books :

Sl. No.	Title	Author, Publisher, Edition & Year
1	Electronics : BJT's, FET's & Microcircuits	Anielo
2	Monograph on electronic circiut design	Goyal & Khetan

(j) Others:

- VCDs.
- Learning Packages.
- Charts.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL
UNIVERSITY, BHILAI**

- A) **SEMESTER** : **V**
 B) **SUBJECT TITLE** : **COMPUTER AIDED DESIGN & DRAFTING
LAB**
 C) **CODE** : **228525 (28)**
 D) **BRANCH/DISCIPLINE** : **Electronics & Tele-communication**
 E) **RATIONALE** : In order to develop and produce an electronic device, a technical passout requires many skills. Drawing intends to equip students with the ability to read and sketch P.C.B. layout and artwork. The advent of computers has also touched the area of design and drawing of electrical and electronic circuits. Hence a technician need to learn to use computers and take its' aid in drawing, designing and enhancing the quality of electronic circuits.

This course also intends to help the student to use the knowledge of CAD for preparing working drawings of electronics projects. The course also aims to develop the skills to build and test analog and digital electronic circuit using electronics workbench software on a computer. It will also be beneficial if a student is aware about other software's being currently used for drawing, drafting and designing of electronic circuits.

These skills are required to develop prototype designs, Printed circuit design, Electronic maintenance and troubleshooting in the industry. This course will also help to provide necessary knowledge & skills for the project work in third year of this diploma programme.

F) TEACHING AND EXMINATION SCHEME:

Course Code	Periods/Week (In Hours) (Teaching Scheme)			Scheme of Examination						Credit L+(T+P)/2
	L	T	P	Theory			Practical		Total Marks	
				ESE	CT	TA	ESE	TA		
228525 (28)	-	-	3	-	-	-	30	10	40	2

L : Lecture hours : T : Tutorial hours, P : Practical hours

ESE – End of Semester Exam.; CT – Class Test; TA- Teacher's Assessment

G) DETAILED COURSE CONTENTS:

Chapter – 1 : Electronic Drawing

- Symbols and codes
- Conventions for schematic representation of electrical and electronic components, instruments and equipment
- Electronic circuit layout
- Sketching of front panel diagrams

- Preparing the layout for the printed circuit boards

Chapter – 2 : Commands of AutoCAD

- CAD concepts
- CAD hardware in brief
- Auto CAD 2000 GUI
- Basic drawing commands
- Facilitating commands
- Editing and modifying commands
- Informative commands
- Dimensioning and text annotation
- Using 'cal expression'
- Creating simple objects using Auto CAD

Chapter – 3 : CAD applications in electronics Using examples from electronics engineering discipline,

- Organizing and working with different layers
- Managing blocks
- Script files and slide show
- 3D visualization
- Surfacing
- Solid modeling and solid editing

Chapter – 4 : Using Multi SIM or Electronics Work Bench like software

- Overview
- Parts Bins
- Building & Testing Analog Circuits
- Analog Instruments
- *Building & Testing Digital Circuits*
- Digital Instruments
- Simulation

Chapter – 5 : Computer aided PCB Design

- Awareness of software for PCB design
- PCB layout of rectifier circuit
- PCB layout of amplifier circuit
- PCB layout of oscillator circuit

Chapter – 6 : Awareness about use of other software

- Exposure to 3 or 4 application software used for electronic applications like (At awareness level only)
- ORCAD
- MATLAB

- CASPOC
- PROTEUS VSM

I) SUGGESTED INSTRUCTIONAL STRATEGIES:

With the background of a course of engineering drawing, this course has to be started first by teaching various software directly on the computer with a little bit of theoretical introduction. For developing computer aided design, the student has to plan on with paper and pencil first which then will have to be done using computer. Therefore, enough of computer time will have to be provided to the students. A number of exercises and assignments will have to be given, so that the students master the techniques of drawing and designing using a computer.

J) SUGGESTED LEARNING RESOURCES

(k) Reference Books :

Sl. No.	Title	Author, Publisher, Edition & Year
1.	IS: 696-1972, Code of practice for General Engineering Drawing	BIS, New Delhi, 1972
2.	Printed Circuit Board. Design & Technology.	William Bosschart , Tata McGraw Hill, New Delhi, 2 nd , 1983
3.	Electronic Drafting & Drawing.	Y.I. Shah, Jeevandeep Prakashan, Ramdeet, Mumbai, 2 nd , 1988
4.	Computer and commonsense	Hunt, R and Shelley, Prentice Hall, New Delhi, 1989
5.	Inside AutoCAD	D. Rakerad H. Rice, BPB Delhi
6.	Computer Aided Drafting and Design	Donald D. Voisinet, McGraw Hill, New Delhi
7.	Basic AutoCAD 2000	Shyam Tickoo
8.	Succeeding with AutoCAD	B. Hawkes, McGraw Hill, 1995

(l) Others:

- Learning Packages.
- Lab Manuals.
- Instructional Manuals,
- User's Guide,
- Educator's Guide,
- Technical Reference etc. for various application software

LIST OF PRACTICALS / TUTORIALS:

1. Draw electronic symbols.
2. Draw electronic components.
3. Draw common electrical and electronic instruments .
4. Draw front panel layout diagrams of typical Dual Cathode Ray Oscilloscope.
5. Draw block diagram of monochrome TV receiver.
6. Draw circuit diagram of radio receiver.
7. Draw circuit diagram, PCB component layout diagram and PCB artwork for discrete series regulated power supply using IC for +5 volts output.
8. Draw orthographic and isometric views of transformer.
9. Draw orthographic and isometric views of loudspeakers & microphones.
10. Provide practical hand on experience in using various commands of Auto CAD 2000 for creating 2D/3D shapes, surface and solid modeling especially with reference to electrical engineering.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL
UNIVERSITY, BHILAI**

- A) **SEMESTER** : **V**
B) **SUBJECT TITLE** : **INDUSTRIAL TRAINING**
C) **CODE** : **228526 (28)**
D) **BRANCH/DISCIPLINE** : **Electronics & Tele-communication**
E) **RATIONALE** : The purpose of industrial training is to offer wide range of practical exposures to latest practices, equipments and techniques used in the field. This training programme will help the student in acquiring hands on experiences of various practices and events required to perform in different job situations. Through the industrial training the students are given an opportunity to develop psychomotor skills and problem solving ability. The students will have to go for industrial training in the areas related to:

1. Television Studios
2. Radio Transmission Stations
3. Digital Telephone Exchanges
4. Cell Phone Exchanges
5. Factories where process/manufacturing are electronically/digitally/ computer controlled may be partially or fully.
6. Small service sector industries looking after the maintenance and repairs of computers, digital telephones, televisions, VCRs, DVDs, CD systems, cellular phones etc.

The duration of industrial training will be of four weeks and organised after the end of V semester examination. The industrial Training has basically the following three components: -

1. Orientation Programme
2. Industrial Training in the Industry
3. Report Writing and Evaluation

Note:

During the orientation programme complete guidelines will be provided to the students regarding planning, implementation and evaluation of industrial training.

During the training student will have to maintain a daily dairy to record his observations and experiences at field and on the basis of daily dairy student has to prepare and submit Industrial Training Report.

For evaluation each student has to prepare and present a seminar paper related to experience gained during the industrial training. Each student will be evaluated on the basis of daily diary, training report, seminar presentation and viva voce.

F) TEACHING AND EXMINATION SCHEME:

Course Code	Periods/Week (In Hours) (Teaching Scheme)			Scheme of Examination						Credit $L+(T+P)/2$
	L	T	P	Theory			Practical		Total Marks	
				ESE	CT	TA	ESE	TA		
228526 (28)	-	-	1	-	-	-	80	20	100	1

L : Lecture hours : T : Tutorial hours, P : Practical hours

ESE – End of Semester Exam.; CT – Class Test; TA- Teacher’s Assessment
